



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,255	08/24/2001	Jean- Louis Gerstenmayer	212701US	2236
22850	7590	07/13/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/914,255	Applicant(s) GERSTENMAYER ET AL.	
	Examiner Shun Lee	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-27, 29-35 and 38 is/are rejected.
- 7) ☒ Claim(s) 28, 36 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 26 November 2001 does not fully comply with the requirements of 37 CFR 1.98 because: (a) it lacks a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed; and (b) each foreign patent or published foreign patent application listed in an information disclosure statement must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Applicant indicates (pg. 12 of remarks filed 30 April 2004) that a copy of FR 2 739 941 dated 18 April 1997 is being provided. However, applicant should note that a copy of FR 2 739 941 was not found within the file. Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. **NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b).** Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered. See 37 CFR 1.97(i).

Claim Objections

2. Claims 18, 28, and 36-38 are objected to because of the following informalities:
(a) in claim 18, "Multi-dimensional" on line 1 should probably be --Bidimensional--;

- (b) in claim 28, "slits" on line 7 should probably be --said slits--;
- (c) in claim 36, "Multi-dimensional" on line 1 should probably be --Bidimensional--;
- (d) in claim 36, "the second face of the block" on line 14 should probably be --a second block face which is located opposite said first block face--;
- (e) in claim 36, "channels" on line 16 should probably be --said slits--;
- (f) in claim 37, "Multi-dimensional" on line 1 should probably be --Bidimensional--;
- (g) in claim 37, "the second face of the block" on line 14 should probably be --a second block face which is located opposite said first block face--;
- (h) in claim 37, "channels" on line 16 should probably be --said holes--; and
- (i) in claim 38, "Multi-dimensional" on line 1 should probably be --Bidimensional--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 18-26 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Charpak (US 5,959,302).

In regard to claims **18** and **38**, Charpak discloses a bidimensional detector (Figs. 1b and 3b) for incident ionizing radiation comprising primary particles whose energies are greater than or equal to 100 keV (column 13, lines 57-66), the detector including:

(a) a block of converting material (121; column 13, lines 57-66) configured to release secondary particles by interaction with the incident ionizing radiation (column 7, line 61 to column 8, line 1; column 14, lines 1-9), wherein a thickness of the block is at least equal to one-tenth of a mean free path traveled by the incident ionizing radiation through the converting material (*i.e.*, the incident ionizing radiation has a maximum path of the order of magnitude of the distance X in Fig. 1b; column 12, lines 47-50); and

(b) parallel slits or holes crossing the block (column 8, lines 5-13; column 7, lines 15-27; column 14, lines 1-9), the slits or holes filled with a fluid configured to interact with the secondary particles to produce tertiary particles indicative in intensity and position of the incident ionizing radiation (*i.e.*, ejected electrons from absorption of ionizing radiation which ionize a gas and release electrons; column 14, line 55 to column 8, line 4), wherein the block is positioned to ensure that the incident ionizing radiation comes in on a first block face where the slits or holes terminate (*i.e.*, frontal inlet; column 3, lines 49-53; column 9, lines 4-9), and wherein a first dimension (*i.e.*, biggest of the hole dimension T; column 7, line 1 to column 8, line 13) of a cross-section of at least one of the parallel slits or holes measured in a plane parallel to the first block face is greater than a second dimension of the

cross-section of the at least one of the parallel slits or holes measured in the plane parallel to the first block face.

In regard to claim **19** which is dependent on claim 18, Charpak also discloses that the slits are perpendicular to the first face of the block (direction E1 in Fig. 1b; see also Figs. 3a and 3b; column 7, lines 52-55).

In regard to claim **20** which is dependent on claim 18, Charpak also discloses (column 13, line 57 to column 14, line 9) that slit planes form an angle of order of 1° (e.g., between 1° and 5°) with a line perpendicular to the first face of the block.

In regard to claim **21** which is dependent on claim 18, Charpak also discloses (column 7, line 48 to column 8, line 4) that the fluid is configured to be ionized by the secondary particles (*i.e.*, ejected electrons), thereby producing electrons as the tertiary particles (*i.e.*, electrons from the gas ionized by the ejected electrons), and the detector further includes means for creating an electric field (V_3 in Fig. 3b) for extracting the tertiary particles from the block (121 in Fig. 3b).

In regard to claim **22** which is dependent on claim 21, Charpak also discloses (column 7, line 48 to column 8, line 4) that the fluid is a gas.

In regard to claim **23** which is dependent on claim 21, Charpak also discloses (column 10, line 54 to column 11, line 12) means for analyzing the electrons extracted from the block.

In regard to claim **24** which is dependent on claim 23, Charpak also discloses (column 10, line 54 to column 11, line 12) that the means for analyzing includes an

avalanche gas amplifier (15 in Fig. 1b) for producing electron avalanches from the electrons extracted from the block.

In regard to claim **25** which is dependent on claim 24, Charpak also discloses (column 10, line 54 to column 11, line 12) that the fluid is a gas and is configured to convert the electron avalanches into visible or ultraviolet radiation, and the means for analyzing further includes means for detecting the visible or ultraviolet radiation.

In regard to claim **26** which is dependent on claim 25, Charpak also discloses (column 10, line 54 to column 11, line 12) that the means for detecting the visible or ultraviolet radiation includes a camera capable of detecting the visible or ultraviolet radiation, or a matrix of amorphous silicon photodiodes placed against the avalanche gas amplifier.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Jeavons *et al.* (The high-density multiwire drift chamber. Nuclear Instruments and Methods, Vol. 124 (1975), pp. 491-503).

In regard to claim **27** which is dependent on claim 21, the detector of Charpak lacks alternating electrically conducting (*i.e.*, converting material) layers and electrically insulating layers with a first conducting layer beginning on the first block face and ending on a second block face opposite the first block face with a last conducting layer, and means for applying electric voltages to the stacked layers, with electric voltages increasing from the first face to the second face, thereby creating an electric field. However, converting material blocks are well known in the art. For example, Jeavons *et al.* teach (section 2.2.2) that a converting material is an electrical conductor which alternate with electrically insulating layers beginning with a conducting layer on the first block face and ending with a conducting layer on a second block face opposite the first block face and on which the slits terminate with means for applying electric voltages to the stacked layers, with electric voltages increasing from the first face to the second face, thereby creating an electric field. Jeavons *et al.* also teach (section 4.2) that the increasing electric voltages can be adjusted to obtain a focusing field. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a well known converting material block (comprising alternating conducting and insulating layers) in the detector of Charpak, in order to

obtain a focusing field by adjusting the increasing electric voltages applied to the conducting layers.

In regard to claim **30** which is dependent on claim 21, Jeavons *et al.* is applied as in claim 27 above. Charpak also discloses (column 8, lines 21-55) that the converting material is for example glass with an electrically conductive coating. Thus the glass converting material is implicitly electrically insulating, or highly resistive. Charpak further discloses (column 8, lines 21-55) that the block includes first and second layers or grids (1210a and 1210b in Fig. 3b) which are electrically conducting and formed, respectively, on the first block face and a second block face which is located opposite the first block face and on which the slits terminate, and the electric field is created by raising the first layer or grid to a first voltage and the second layer or grid to a second voltage which is greater than the first voltage.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Jeavons *et al.* (The high-density multiwire drift chamber. Nuclear Instruments and Methods, Vol. 124 (1975), pp. 491-503) as applied to claim 27 above, and further in view of Amleshi *et al.* (US 5,633,501).

In regard to claim **29** which is dependent on claim 27, the modified detector of Charpak lacks that the layer of the converting material located at the second face of the block is blackened out to prevent parasitic light reflections. Amleshi *et al.* teach (column 2, lines 4-6) to provide a non-reflective electrode for an ionization sensor in order to minimize noise contributions at a photosensor. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a non-reflective

electrode (e.g., a blackened out converting material layer) at the second block face in the modified detector of Charpak, in order to reduce reflection from the second block face so as to minimize noise contributions at the means for detecting visible or ultraviolet radiation.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Hanawa (US 4,476,390).

In regard to claim **31** which is dependent on claim 18, Charpak is applied as in claim 30 above. While Charpak also discloses (column 13, line 57 to column 14, line 9) a plurality of thin inclined sheets (*i.e.*, strips) according to known prior art techniques, the detector of Charpak lacks an explicit description of spacers which separate the strips from each other. It should be noted that a spacer is an element which¹ organize or arrange with spaces between which are well known in the art. For example, Hanawa teaches spacers (18 in Fig. 2) which separate the strips from each other. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide spacers in the detector of Charpak, in order to obtain a plurality of separated thin inclined sheets.

10. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Marsden (US 4,816,683).

In regard to claim **32** which is dependent on claim 18, the detector of Charpak lacks that the block is firstly manufactured and then the slits are manufactured by one of the following techniques: waterjet cutting, electrical discharge machining, and roll-out

Art Unit: 2878

stretch wire. However, manufacturing converting material blocks is well known in the art. For example, Marsden teaches (column 4, lines 1-21) using spark-erosion (*i.e.*, electrical discharge) machining in order to manufacture slits in a converting material block (column 2, lines 11-15). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to manufacture the detector of Charpak using spark-erosion, in order to obtain a plurality of slits in the converting material block.

11. Claims 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Marsden (US 4,816,683) as applied to claim 32 above, and further in view of Jeavons *et al.* (The high-density multiwire drift chamber. Nuclear Instruments and Methods, Vol. 124 (1975), pp. 491-503).

In regard to claim **33** which is dependent on claim 32, Charpak in view of Jeavons *et al.* is applied as in claim 27 above. The modified detector of Charpak lacks that the layers are stuck to each other. However, manufacturing converting material blocks is well known in the art. For example, Marsden teaches (column 3, lines 34-36) that the layers are laminated (*i.e.*, stuck) to each other to form a plurality of layers. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to stick together layers in the modified detector of Charpak, in order to obtain a thick converting material block.

¹ The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from INSO Corporation; further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.

In regard to claim **35** which is dependent on claim 32, Charpak in view of Jeavons *et al.* is applied as in claim 30 above and Marsden is applied as in claim 33 above.

12. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Charpak (US 5,959,302) in view of Marsden (US 4,816,683) as applied to claim 32 above, and further in view of Inoue (US 4,427,870).

In regard to claim **34** which is dependent on claim 32, the modified detector of Charpak lacks that, before creating each slit, a guide hole is made in the block which is then used to create the slit. However, manufacturing converting material blocks using electrical discharge machining is well known in the art. For example, Inoue teaches (column 1, lines 27-32) that electrical discharge machining comprises a starting (*i.e.*, guide) hole. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a starting hole for the manufacture of the modified Charpak detector using spark-erosion, in order to obtain a plurality of slits in the converting material block.

Allowable Subject Matter

13. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be directed to a nonobvious improvement over the invention patented in US Patent 5,959,302. The improvement comprises in

combination with other recited elements, a supplementary layer formed on an additional electrically isolating layer, the additional electrically isolating layer formed on the last layer of the converting material, located at the second face of the block, whereby the supplementary layer is made of an electrically conducting material configured to absorb the secondary particles created in the last layer.

Response to Arguments

15. Applicant's arguments filed 30 April 2004 have been fully considered but they are not persuasive.

Applicant argues (pg. 13-15 of remarks filed 30 April 2004) that Charpak does not disclose a multi-dimensional detector that includes parallel slits crossing the block having one cross-sectional dimension greater than another cross-sectional dimension. Examiner respectfully disagrees. Charpak states (column 7, line 1 to column 8, line 13) that " ... This plate is pierced with holes represented in a non-limitative way by circular holes in FIG. 2b, each hole 130_i being distant from another hole by a pitch P and having a dimension T in order to form an array of holes such as shown in the said figure ... the biggest dimension T of each hole 130_i, this dimension corresponding to the diameter of the holes when the latter are circular ... In a particular embodiment, the plate forming the second electrode 13 comprised a grid of thickness 3 μm , pierced with 20 μm square holes, T=20 μm and spaced by the pitch P=25 μm A more detailed description of a variant embodiment of the high resolution radiographic imaging device which is the subject of the present invention will now be given with reference to FIG. 3a. ... parallel channels, referenced 121_i, having at least one opening emerging on a flat surface of

this structure. As furthermore shown in the said FIG. 3b, the assembly of these openings forms, on the flat surface of the micro-channels structure, an array of holes at the same pitch P and with the same dimension T as the array of holes 130, existing on the grid forming the second electrode 13". The key phrase is "the biggest dimension T of each hole". Thus, the holes of Charpak are not limited to circular holes with dimension (*i.e.*, diameter) T but encompass non-circular holes with dimension T. Therefore, Charpak teaches parallel channels (*i.e.*, slits) having opening emerging on a flat surface of this structure which form an array of (circular and/or non-circular) holes with dimension T.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL


DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

